PROTECTOWIRE® FireSystems

FireSystem 2000 Commercial and Light Industrial Fire Alarm Control Panel

Features

- Easily expandable. All new plug-in board design
- Two supervised audible circuits
- Lamp and system trouble circuit test
- Ground fault detection
- LTi Series NEMA 4/12 enclosures available
- Monitors up to 5,000 feet (1,524m) of Protectowire Linear Heat Detector per zone
- Up to 30 smoke detectors per zone

Description

The FireSystem 2000 is a fully supervised, non-coded fire alarm control panel available in multiple zone configurations. The control panels are modular in design and feature individual control modules designed to meet specialized system requirements for commercial, institutional, and light industrial applications. The system is both UL listed and FM approved and conforms to applicable NFPA 72 requirements for local and auxiliary protective signaling systems. It may also be used as part of a proprietary fire alarm system or, when properly configured, is capable of sprinkler supervisory service, water flow alarm, preaction sprinkler or deluge system release.

The basic 2-wire system control panel and its associated power supply provide the following standard features: two (2) supervised detection circuits, that may be field wired for either Class A (Style D) or Class B (Style B); two (2) supervised Class B (Styles W & Y) audible appliance circuits; battery charger and monitor; ground fault detection; lamp test; one (1) set of SPDT common alarm contacts, two (2) sets of Form A or B (selectable) common trouble contacts, and one (1) set of Form A or B (selectable) common supervisory contacts. Common trouble contacts may be programmed for silenceable or non-silenceable operation.

Flexibility

The basic 2000 Series Control Panel is designed for easy expansion of system capability by adding additional modules and functions to the standard system. The 2000 will accommodate a combination of the following options:

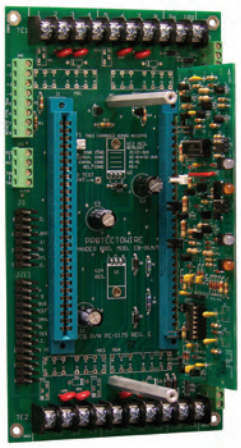
- Protectowire alarm point location meter
- Extinguishing system release and supervision
- Water flow detection
- Fire and non-fire supervisory monitoring
- Intrinsically safe detection zones
- Supplementary relays

A complete list of available options is included in the "System Configuration Guide" section of this catalog sheet.

System Expansion

The basic 2-wire control unit consists of two (2) detection zones, and requires one module space in the system enclosure. The zone capacity of the basic system can be expanded up to a maximum of forty-six (46) zones in one EN12 enclosure, by utilizing the required number of plug-in zone modules and their associated EB-91A zone expander boards. Each standard 2-wire zone module requires a half module space in the system enclosure and contains two (2) individual detection circuits. To monitor the two detection circuits, a red LED zone alarm indicator and a yellow zone trouble indicator are supplied for each zone. Supervisory zone cards utilize two yellow LED indicators per zone to indicate supervisory alarm and supervisory trouble.

FS2000 Basic control module



Zone expander board (EB-91A) with one plug-in zone module

The modular system design enables the system to be modified at any time. The required number of input and output circuits and system options are custom assembled and tested at the factory to ensure exact conformance with the customer's application requirements.

System Features

Nine system status indicators are mounted on the main control board. A green POWER ON LED, a red SYSTEM ALARM LED, a yellow SYSTEM TROUBLE/SUPERVISORY signal LED, and a yellow GROUND FAULT indicator. Additional yellow indicating LED's are provided for ALARM SILENCED, AUDIBLE SIGNAL CIRCUITS OPEN/SHORTED, BATTERY LOW and BATTERY OUT.

Standard system controls consist of four push button switches which provide the following functions: System Reset, Alarm Silence, Trouble Silence, and Lamp and Trouble Test.

Protectowire Alarm Point Location Meter (Option A) and Scanner (Options C, C2, & C3)

Protectowire introduces "smart" detector technology to Linear Heat Detectors. The PDM-1000-2 Meter (Option A) may be built into the 2000 Series Control Panel to locate a heat actuated point on the Protectowire Linear Heat Detector. The meter will display the distance in feet or meters from the start of the Detector portion of the zone to the overheated or actuated point on the Protectowire Linear Heat Detector.

PDM-1000–2 Protectowire alarm point location meter with 16 zone alarm scanner. (Options A & C)

A Zone Alarm Scanner option for the PDM-1000-2 is available which allows for automatic identification and display of the Protectowire zone in alarm, as well as the alarm point distance location, while still monitoring the remaining Protectowire zones for an alarm condition. The Scanner is available in the following configurations: 16 zones (Option C), 32 zones (Option C2), and 48 zones (Option C3).

Solenoid Release & Initiating Device Module (Option F)

The RS-1 Solenoid Release and Initiating Device Modules are designed to operate and supervise solenoid valves used for the actuation of extinguishing systems. The plug-in module provides one (1) supervised solenoid output circuit and one (1) Class B (Style B) initiating device circuit that is jumper selectable for either alarm or supervisory field devices.

Release logic and activation of the module is governed by the appropriate programmed detection zone(s) in the 2000 Series Control Panel. Once the module is activated, a 24VDC output is initiated to energize the solenoid coil of the control valve to begin the extinguishing agent release sequence and a red LED "Trip" indicator will light showing that voltage has been supplied to the releasing circuit field terminals. Cross-zoned operation is achieved through the use of the ZV-91 Zone Voting Module (Option V) or by removing a micro-jumper and applying appropriate outputs from either the MB-91A Main Board or EB-91A Expander Board.

The release circuit is supervised for open and shorted conditions. In the case of an open or short, the system trouble buzzer will pulse and the appropriate yellow trouble LED will illuminate. A circuit discon-

nect switch is also provided to deactivate the module during servicing of the system.

The RS-1 release module is UL listed and is approved by Factory Mutual for actuation of FM Solenoid Groups A, B, and D through K. The

Solenoid monitor and release module with Class B initiating circuit. (Option F)

module can also be configured to operate the Star D deluge valve (FM Solenoid Group C), but is not currently FM Approved for Star D service. This option requires half a module space in the system enclosure.

Intrinsically Safe Detection Circuits (Options H & K)

The 2000 Series can be provided with intrinsically safe Class B detection circuits for those areas that are classified as hazardous. The voltage and current in the detection circuits will be limited to values which are incapable of causing an explosion in a Division 1 area. Up to 3,500 ft. (1,067m) of Protectowire Linear Heat Detector and/or other non-energy storing contact initiating devices may be used per circuit. Two FM Approved options are currently offered for the 2000 Series Control Panels:

Option H utilizes one shunt diode barrier per zone and has been FM Approved for NEC Classes I, II, and III, Division 1, Groups A, B, C, D, E, F, and G. This option permits the use of the Protectowire Alarm Point Location Meter (Option A) but requires that the system ground fault detection circuit be disabled.

Option K consists of a dual channel DC Isolator interfaced with the detection circuits. One (1) Option K is required for every two (2) zones. This option is FM Approved for NEC Classes I, II, and III, Division 1, Groups A,B, C, D, E, F, and G. Option K permits the use of the system ground fault detection circuit for all other non-isolated system circuits. This option has the following restrictions: Not compatible with the Protectowire Alarm Point Location Meter (Option A). Due to space limitations, the use of Option K is limited to LTi Systems only.

Battery Charging Meters (Option P)

Battery Charging Meters (Option P) consist of a DC volt meter and DC amp meter which provide a numerical indication of the system's battery condition. These meters provide an accurate display of both the charging current draw and the battery standby voltage level. Option P is side wall mounted inside the enclosure, and may be viewed only when the enclosure door is opened.

Audible Alarm Circuits (Options T & U)

Each 2000 Series Control Panel contains two standard Class B (Styles W & Y) general alarm circuits which are contained on the main control board. These audible circuits may be wired in a Class A (Styles X & Z) configuration when Option T is ordered.

Additional audible alarm circuits may be added to the system by utilizing AE-91 Audible Expander Modules (Option U). Each module provides one (1) audible alarm signaling circuit which may be wired in either a Class A (Styles X & Z) or Class B (Styles W & Y) configuration. These plug-in modules may be provided in a latching or non-latching mode and will also accept up to four (4) inputs for selective activation by zone or groups of zones. Option U requires half a module space in the system enclosure, and the total circuit load may not exceed 1.0 amp.

Zone Voting Module (Option V)

The ZV-91 Zone Voting Module (Option V) is designed to supply a specific output signal(s) upon the receipt of multiple input signals.

The ZV-91 contains a programmable resistor network that will accept up to 16 input signals. The 16 inputs are arranged into four (4) groups of four (4) with each group capable of providing a designated output signal (total 4). When used in a voting zone format, the module inputs can be selectively programmed to provide an output signal upon activation of any two or three of the 16 inputs. When a cross-zoned configuration is required, the module will accept a maximum of eight (8) inputs or zones, and can provide up to a maximum of four (4) separate ouputs.

The module provides excellent system versatility in control function logic. Typical application examples are: actuation of selected relays from the operation of two or more independent initiating circuits; activating an AE-91 Audible Expander Module from a number of select initiating device circuits; and cross-zoning of initiating device circuits and/or supervisory circuits. The ZV-91 is designed for mounting on the sidewall of the enclosure, and does not require a designated module space when sizing the system enclosure.

Auxiliary Power Supply (Option W)

The Auxiliary Power Supply (Option W) is designed to increase the overall system power from 5.25 Amps to 9.0 Amps on any FS2000 Series Control Panel. The PS-2 supplies additional regulated power for detection zones, solenoid release circuits, auxiliary audible circuits, alarm relays, or other high power demand devices which may exceed the capacity of the system's main power supply.

The unit is completely supervised. Should the power supply fail, a trouble signal illuminates the system trouble LED, and the on-board buzzer will activate. The PS-2 operates on primary AC power of 120VAC, 50-60Hz at 1.75 amps maximum, and provides 4.2 amps of DC power under alarm conditions.

Power Conditioning Module (Option Y)

The PS-95 Power Conditioning Module (Option Y) is designed to provide filtered, regulated DC power from unfiltered, unregulated DC power sources. When 24VDC input power for the PS-95 is taken from the proper point on the control panel, battery backup is provided automatically to devices powered by the module. When operating on battery backup, the PS-95's unique design prevents any voltage drop from occurring across the module.

The PS-95 features an AC-ON green LED indicator and a BACK-

UP ON yellow LED indicator. Reset can be accomplished by utilizing the main panel system reset switch or the push button switch located on the module. Provision has also been made to accept a N/O switch connection for remote reset capability.

The module has a current output of 1.5 A @ 26VDC at idle, and 2.0 A @ 26VDC during alarm. Output voltage is factory calibrated at 25.5 to 26VDC.

System Enclosures

EN Commercial Series – NEMA Type 1
The EN Series System Enclosures are designed to accommodate all input and output modules, power supplies, and batteries (up to 18AH) utilized in the FireSystem 2000.

Each enclosure consists of a back box and door, fabricated of heavy gauge steel and finished in a fine textured beige epoxy enamel finish. The enclosure door, which is mounted on heavy duty sag-resistant hinges, is fitted with a key lock, and may be removed from the back box to permit easy installation and service. Red enclosures are optionally available and may be ordered by adding the suffix "R" to the enclosure model number.

Each enclosure is vented, which allows for internal placement of the emergency standby batteries. The largest battery supplied by the factory, which may be installed in each model enclosure is indicated in the chart below. When the system's battery size requirements exceed the sizes shown, a separately ordered battery cabinet is required. Consult factory for information.

Encl.	Module Spaces	Max. battery size	Width Inches (cm)	Height Inches (cm)	Depth Inches (cm)
EN2	2	10AH	21" (53.3)	17" (43.2)	5" (12.7)
EN4	4	18AH	21" (53.3)	31" (78.7)	5" (12.7)
EN6	6	18AH	26" (66.0)	31" (78.7)	5" (12.7)
EN9	9	18AH	26" (66.0)	42" (106.7)	5" (12.7)
EN12	12	18AH	26" (66.0)	53" (134.6)	5" (12.7)

LTi Industrial Series — NEMA Type 4/12 & 4X
The LTi Series Enclosures are intended for use indoors or outdoors and are designed primarily to provide a degree of protection against windblown dust and rain, splashing water, hose-directed water, and damage from external condensation. To prevent the build-up of dangerous battery gases within the sealed enclosure, a separately ordered battery cabinet is required. For additional information on LTi Enclosures, refer to Data Sheet 9130.

Encl. Model	Module Spaces	Width Inches (cm)	Height Inches (cm)	Depth Inches (cm)	Encl. Color
LTi2X	2	19.5" (49.5)	17.5" (44.5)	9.0" (22.9)	Red
LTi4	4	24.0" (70.0)	34.0" (86.4)	6.9" (17.4)	Red
LTi6	6	29.0" (73.7)	34.0" (86.4)	6.9" (17.4)	Red
LTi9	9	29.0" (73.7)	45.0" (114.3)	6.9" (17.4)	Red

FireSystem 2000 Specifications

AC Supply
120 or 240VAC, 50-60Hz, 1.75 amp max.
Battery Supply
24VDC 4.5-55 ampere hour.
Gel cell (standard)
Nickel cadmium (special order)
Environmental Operation Conditions
Ambient temperature: 32°-120°F (0°-49°C).
Humidity: Max. 95% non-condensing.
Primary System Power
24V FWR by Tl, 175VA typical.
System Regulated Power
Each board (MB, EB, RS) has full voltage regulation, 12VDC and 24VDC.
Audible Signaling Device Circuits
24V – FWR with battery standby.
Maximum current: 2 amp/circuit, 3 amp combined.
Requires polarized audible devices.
Relay Contact Ratings
Common alarm: 3 amp @ 30VDC.
Common trouble: 1 amp @ 24VDC (silenceable or non-silenceable).
Common supervisory: 1 amp @ 24VDC.
Approvals*
• UL listed (9th Edition) • City of New York #MEA–374–91E
• Factory Mutual • Calif. State Fire Marshal #7165–0854:103

How To Order

Determine the type of system configuration required and follow the appropriate ordering instructions:

Step 1 **System will contain all Standard 2-wire Detection Zones.**
Select the Basic Control Unit which contains the required number of standard 2-wire detection zones.

Proceed to Step 2 and continue the ordering process as instructed. Determine the number of 2–wire detection zones required, and select the appropriate system control unit from the models shown in the table below.

Basic 2–Wire System Control Units

Model #	Enclosure Module Spaces	Description
FS2002	1	2 zones
FS2004	1½	4 zones
FS2006	2	6 zones
FS2008	2½	8 zones
FS2010	3	10 zones
FS2012	3½	12 zones
FS2014	4	14 zones
FS2016	4½	16 zones
FS2018	5	18 zones
FS2020	5½	20 zones
FS2022	6	22 zones
FS2024	6½	24 zones
FS2026	7	26 zones

continued

FS2028	7½	28 zones
FS2030	8	30 zones
FS2032	8½	32 zones
FS2034	9	34 zones

Add ½ module space for each additional 2 zones.

Step 2 Select option code letter(s) from the "System Configuration Guide" section of this catalog sheet and show quantity when necessary. Note options which require enclosure module space(s).

Step 3 To determine the proper size system enclosure, add the module spaces required for the basic control unit (Step 1) plus the module spaces required for the quantity of each option selected (Step 2). If the total module spaces required for the system exceed the size of the largest enclosure, a second extender enclosure will be required. Select two enclosures whose total module capacity equals or exceeds that required for the complete system.

Step 4 Finalize complete system model number as shown in the System Configuration Guide, Section D.

Step 5 Each 2000 Series Control Panel is custom assembled and tested at the factory as a complete system. In order to ensure conformance with each customer's operational requirements, every order should be accompanied by a brief description of the panel's operating logic and zone functions.

System Configuration Guide

A. Model number of basic system control unit selected in Step 1.
Specify AC input voltage: **120** or **240VAC**
Specify battery charger adjustment code: **GC** – Gel Cell (Std.)
NC – Nickel Cadmium

B.

Options	Encl. mod. space		
A	–	Protectowire alarm point location meter PDM–1000–2	
C	1	16 zone alarm scanner	Requires Option A
C2	1	32 zone alarm scanner	
C3	1	48 zone alarm scanner	
D	½	Water flow detection zones (2/card)	
E	½	Switch supervisory circuits Class A/B (2 circuits/module)	
F	½	Solenoid release and initiating device module (1 release and 1 Class B initiating circuit/module)	
H	–	Intrinsic safety barrier for Class B, 2-wire	
(1-2)	0	detection circuits	
(3-16)	1	(Option not available with system	
(17-32)	2	ground fault detection)	
		Determine module space based upon zone qty. shown in brackets.	
K	–	Dual Channel DC Isolator for two (2) Class B, 2-wire detection circuits (Not compatible with Option A)*	
L	–	Auxiliary output relay – SPDT	
LL	–	Auxiliary output relay – DPDT	
P	–	Battery charging meters	
Q	–	Time delay relay	
R	–	Auxiliary common alarm relay – DPDT	
RR	–	Auxiliary relay module – 8-SPDT relays (1 amp @ 24 VDC)	
S	–	Auxiliary common trouble relay – DPDT	
T	–	Class A (NFPA Styles X & Z) audible circuits (main panel, general alarm only)	
U	½	Audible expander card (I circuit, Class A or B)	
V	–	Zone voting module	
W	–	PS–2 auxiliary power supply	
Y	–	PS–95 power conditioning module	
Z	–	Door mounted, key operated, control switches (reset, alarm silence, trouble/supervisory silence & lamp test)	

C. Enclosures

EN2	Commercial Type NEMA 1	2 module enclosure
EN4	Commercial Type NEMA 1	4 module enclosure
EN6	Commercial Type NEMA 1	6 module enclosure
EN9	Commercial Type NEMA 1	9 module enclosure
EN12	Commercial Type NEMA 1	12 module enclosure
LTi2X	Industrial Type NEMA 4X	2 module enclosure
LTi4	Industrial Type NEMA 4/12	4 module enclosure
LTi6	Industrial Type NEMA 4/12	6 module enclosure
LTi9	Industrial Type NEMA 4/12	9 module enclosure

D. Example of complete system model number. Note that the quantity of each option ordered is shown after its Option Code Letter.
FS2004-120-GC-F2-EN6
Control panel with four 2–wire detection zones operating on 120VAC 50–60Hz input & gel cell battery backup; (2) solenoid release and initiating device modules (1 release & 1 Class B initiating circuit/module); all in a six (6) module beige enclosure.

Not all options are both UL Listed and FM Approved. Consult factory for details.

** Size restrictions limit use of Option K to LTi Systems only.*

Protectowire Total System Capability

Now it is easier than ever to specify a complete Protectowire System with all of its unique features and reputation for reliability. The Protectowire Company offers an extensive line of fire and heat detection sensors and related products, including:

- Optical Flame Detectors
- Manual Pull Stations
- Smoke Detectors
- Heavy-Duty Alarm Bells
- Horns
- Visual Signals/Strobes

All Protectowire products have been specifically designed and tested for compatibility and reliable operation with Protectowire Control Panels.

Contact your local authorized Protectowire distributor for help in planning the system best suited to your needs.

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SPECIAL HAZARD FIRE DETECTION SYSTEMS